driving the plasma display panel according to an image signal while decreasing a drive frequency of sustain discharges as a display load factor increases, wherein when the display load factor decreases, an intensity of the image signal of blue is decreased or an intensity of the image signal of green is increased compared with a case when the display load factor is higher.

REMARKS

STATUS OF CLAIMS

Claims 1-26 are pending and rejected.

By this Amendment, claims 1-6, 11, 13-20, 22 and 24-26 are amended. Therefore, claims 1-26 are now presented for consideration.

No new matter is presented and approval and entry are respectfully requested.

DRAWING STATUS ACKNOWLEDGMENT

No indication of the status of the drawings is provided in item 10 of the Office Action Summary. Please acknowledge the acceptability of the Drawings (Figs. 1, 2A-2B, and 3-10) in the next Office Action.

REJECTION OF CLAIMS 1-6 and 21-26 UNDER 35 U.S.C. §102(e) AS BEING ANTICIPATED BY KASAHARA ET AL.

In the Office Action at pages 2-5, items 2-7, claims 1-6 and 21-26 are rejected under 35 U.S.C. §102(e) as being anticipated by Kasahara et al. (U.S. Patent No. 6,331,843).

Applicants respectfully traverse the rejection and request reconsideration of claims 1-6 and 21-26.

The Examiner asserts, in the Office Action at page 2, lines 18-22, that Kasahara et al. teaches a plasma display panel in which:

> "[the] drive unit makes correction to change the emission intensity of a fluorescent substance of a predetermined color, so that the ratio of the emission intensity of said fluorescent substance of each color during white display is roughly the same when said display load factor is low and high, depending on a change of the display load factor, [at] **column 3 lines 33-44, column 21 lines 10-20, column 22 lines 5-15**" (brackets inserted).

Applicants respectfully disagree with the Examiner as Kasahara et al. does not discuss "a ratio of an emission intensity ... of each color" and, furthermore and more particularly, does not disclose or suggest "wherein said drive unit makes a correction to change an intensity of the image signal of a predetermined color, so that a ratio of the emission intensity ... of each color ... is roughly the same when said display load factor is low and high" (as recited in claim 1). This is because the Kasahara et al. display apparatus adjusts "a subfield number in accordance with brightness [of an image]" (brackets inserted) (see Kasahara et al. at column 2, lines 47-51) and, more particularly, Kasahara et al. discloses that "[b]y increasing the subfield number, it is possible to eliminate pseudo-contour noise ..." (See Kasahara et al. at column 2, lines 56-57.)

Thus, the intent of Kasahara et al. is to eliminate pseudo-contour noise and Kasahara et al. is silent about achieving a color balance of the display apparatus such that "a ratio of the emission intensity ... of each color ... is roughly the same when said display load factor is low and high" (as recited in claim 1).

Further, according to Kasahara et al., when the gradation of an image is increased due to the image, a number of sub-fields Z is increased (see Kasahara et al. at column 25, lines 3-35) and when a contrast of the image is emphasized due to the image, the number of sub-fields Z is decreased and a number of drive pulses for each sub-field is increased (see Kasahara et al. at column 27, lines 23-32). Therefore, in the Kasahara et al. display apparatus, based on the brightness of the image, the number of sub-fields and the number of drive pulses are adjusted by the image characteristics determining device 30 in Fig. 11.

In contrast to the invention as recited in claim 1, in the Kasahara et al. display apparatus, the emission intensity of all colors are adjusted simultaneously. This is because in the display apparatus of Kasahara et al., all of the different color cells are driven simultaneously by the sustaining driver 22. Therefore, a combination of sub-fields and the sustain pulses of each sub-field are the same for all of the different colors. Further, in Kasahara et al., since the number of sub-fields and the number of sustain discharge pulses are adjusted, the emission intensities of the different colors are adjusted in the same manner and not differently --e.g. individually, one color by one color--. This is supported by, for example, the disclosure of Kasahara which provides "[t]he following explanation, unless otherwise stated, deals with a G signal, but the explanation applies equally to R, B as well." (See Kasahara et al. at column 1, lines 26-29.)

According to the invention recited in claim 1, the drive unit "makes a correction to change an intensity of the image signal of a predetermined color, so that a ratio of an emission intensity of said fluorescent substance of each color during a white display is roughly the same when said display load factor is low and high ..." That is the drive unit makes a correction to change an intensity of the image signal of a predetermined color to achieve color balance. By contrast, Kasahara et al. adjust the emission intensities of all colors in the same manner.

Accordingly, claim 1 patentably distinguishes over the cited art and is submitted to be allowable.

As above-mentioned with respect to claim 1, Kasahara et al. does not disclose or suggest corrections so that an emission intensity of each color is color balanced when a display load factor is low and high.

Claim 2 is directed to a plasma display panel and recites "a drive unit which receives an image signal of said different colors and drives the panel according to the image signal while decreasing a drive frequency of sustain discharges as a display load factor increases, wherein when the display load factor increases, said drive unit makes a correction so that an intensity of the image signal of green is decreased or an intensity of the image signal of blue is increased compared with a case when the display load factor is lower." Thus, in the invention as recited in claim 2, the intensity of the image signal of green is decreased or the intensity of the image signal of blue is increased when the display load factor increases.

Accordingly, claim 2 patentably distinguishes over Kasahara, et al., and is submitted to be allowable.

Claim 3 should also be allowable for similar reasons as noted above for claim 2.

Claims 4-6, which depend from claim 3, are submitted to be allowable for the same reasons as claim 3, as well as for the additional recitations therein.

Claim 21 is submitted to be allowable for similar reasons as noted above for claim 1.

Claims 22 and 23 are submitted to be allowable for similar reasons as noted above for claim 21.

Claim 24 is submitted to be allowable for similar reasons as noted above for claims 1 and 2.

Claims 25 and 26 are submitted to be allowable for similar reasons as noted above for claims 2 and 3, respectively.

REJECTION OF CLAIMS 7-10 UNDER 35 U.S.C. §103(a)

In the Office Action at pages 6-8, items 13-15, claims 7-10 are rejected under 35 U.S.C. §103(a) as unpatentable over Kasahara et al.

Applicants respectfully traverse the rejection and request reconsideration.

Claims 7-10 are directed to a plasma display panel and respectively recite "a chromaticity coordinate value during a white display is roughly constant regardless of a display load"; "a color temperature value during a white display is roughly constant regardless of a display load"; "a deviation from a color temperature curve denoted by a black body radiation curve during a white display is roughly constant regardless of a display load"; and "a chromaticity coordinate value during a white display is within ±0.005uv of a deviation region from a color temperature curve denoted by a black body radiation curve regardless of a display load."

Kasahara et al. does not disclose or even suggest the respective above-mentioned recitations in claims 7-10. This is because, as previously mentioned, Kasahara et al. does not discuss color balancing and thus Kasahara et al. is silent regarding "a chromaticity coordinate value", "a color temperature value", and "a deviation from a color temperature curve value."

Accordingly, it is submitted that claims 7-10 are allowable.

REJECTION OF CLAIMS 11 AND 12 UNDER 35 U.S.C. §102(e)

CLAIM 11

Claim 11 is directed to a plasma display panel and recites "a detector to estimate a display load factor by detecting one of a power consumption of the plasma display panel and a drive frequency of sustain discharges of the plasma display panel; a drive unit ... changing the drive frequency of sustain discharges according to the estimated display load factor ... so that a ratio of an emission intensity of each of the different colors during a white display is substantially equal regardless of the display load factor."

REJECTION OF CLAIMS 11 AND 12 UNDER 35 U.S.C. §102(e) AS BEING ANTICIPATED BY KASAHARA ET AL.

In the Office Action at pages 2 and 3, items 2-3, claims 11 and 12 are rejected under 35 U.S.C. §102(e) as being anticipated by Kasahara et al.

Reconsideration of the rejection is respectfully requested.

Kasahara et al. does not disclose or even suggest the estimation of the display load factor by a detector for color balance so that a ratio of an emission intensity of each of the different colors during a white display is substantially equal regardless of the display load factor. This is because, as previously mentioned, Kasahara et al. does not discuss color balancing.

Accordingly, it is submitted that claim 11 patentably distinguishes over Kasahara et al. and should be allowable thereover.

Claim 12, which depends from claim 11, should be allowable over Kasahara et al. for the same reasons as claim 11, as well as for the additional recitation therein.

REJECTION OF CLAIM 11 UNDER 35 U.S.C. §102(e) AS BEING ANTICIPATED BY YOU

In the Office Action at pages 5-6, items 8-9, claim 11 is rejected under 35 U.S.C. §102(e) as being anticipated by You (U.S. Patent No. 6,034,655).

Reconsideration of the rejection is respectfully requested.

You does not disclose or even suggest the above-mentioned recitation of claim 11 and, in particular, does not discuss the detector and, furthermore, the estimation of the display load factor thereby for color balance. This is because You does not discuss anything related to display load factor.

Accordingly, it is submitted that the claim 11 patentably distinguishes over You and should be allowable thereover.

REJECTION OF CLAIM 11 UNDER 35 U.S.C. §102(e) AS BEING ANTICIPATED BY KANG

In the Office Action at page 6, items 10-11, claim 11 is rejected under 35 U.S.C. §102(e) as being anticipated by Kang (U.S. Patent No. 6,400,347).

Reconsideration of the rejection is respectfully requested.

Kang does not disclose or even suggest the above-mentioned recitation of claim 11 and, in particular, does not discuss the detector and, furthermore, the estimation of the display load factor thereby for color balance. This is because Kang at most discusses "measuring the brightness of each color signal," (see Kang at column 4 lines 43-44), but the Kang method does not detect "one of a power consumption of the plasma display panel and a drive frequency of sustain discharges of the plasma display panel" (as recited in claim 11).

Accordingly, it is submitted that the claim 11 patentably distinguishes over Kang and should be allowable thereover.

REJECTION OF CLAIMS 13-20 UNDER 35 U.S.C. §103(a)

In the Office Action at pages 8 and 9, items 16 and 17, claims 13-20 are rejected under 35 U.S.C. §103(a) as unpatentable over Kasahara et al in view of You.

Reconsideration of the rejection is respectfully requested.

Claim 11 is submitted to be allowable as neither Kasahara et al nor You disclose or suggest the estimation of the display load factor by a detector for color balance so that a ratio of an emission intensity of each of the different colors during a white display is substantially equal regardless of the display load factor as previously discussed with respect to the rejection of claim 11 under 35 U.S.C. §102(e).

Thus, claim 11 patentably distinguishes over the cited art singularly or in a proper combination and should be allowable. Claims 13-20, which depend from claim 11, should also be allowable for the same reasons as claim 11, as well as for the additional recitations therein.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is respectfully solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 3/3/03

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please AMEND the following claims:

1. (TWICE AMENDED) A plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, comprising:

a drive unit which receives an image signal of said different colors and drives the panel according to the image signal while [by] decreasing a drive frequency of sustain discharges as a display load factor increases,

wherein said drive unit makes a correction to change an [emission] intensity of [a fluorescent substance] the image signal of a predetermined color, so that a ratio of [the] an emission intensity of said fluorescent substance of each color during a white display is roughly the same when said display load factor is low and high, depending on a change of the display load factor.

2. (TWICE AMENDED) A plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, comprising:

a drive unit which receives an image signal of said different colors and drives the panel according to the image signal while [by] decreasing a drive frequency of sustain discharges as a display load factor increases,

wherein when the display load factor increases, said drive unit makes a correction so that an [emission] intensity of the image signal of green is decreased or an [emission] intensity of the image signal of blue is increased compared with a case when the display load factor is lower.

3. (TWICE AMENDED) A plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, comprising:

a drive unit which receives an image signal of said different colors and drives the panel according to the image signal while [by] decreasing a drive frequency of sustain discharges as a display load factor increases,

wherein when the display load factor decreases, said drive unit makes a correction so that an [emission] intensity of the image signal of green is increased[,] or an [emission] intensity of the image signal of blue is decreased compared with a case when the display load factor is higher.

4. (THREE TIMES AMENDED) The plasma display panel according to claim 3, wherein said drive unit monitors a power consumption of the panel and corrects said [emission] intensity of the image signal of green or blue on a condition that said display load factor increases when said power consumption increases, and said display load factor decreases when said power consumption decreases.

5. (THREE TIMES AMENDED) The plasma display panel according to claim 3, wherein said drive unit monitors the drive frequency of the sustain discharges of the panel, and corrects said [emission] intensity of the image signal of green or blue on a condition that said display load factor increases when said drive frequency decreases, and said display load factor decreases when said drive frequency increases.

6. (THREE TIMES AMENDED) The plasma display panel according to claim 3, wherein said drive unit monitors a luminance value and/or a display area value of each color to be supplied per predetermined unit time, and corrects said [emission] intensity of the image signal of green or blue on a condition that said display load factor increases when an accumulated total of said luminance value and/or display area value per predetermined unit time is higher, and said display load factor decreases when the accumulated total of said luminance value and/or display area value per predetermined unit time is lower.

7. (AS ONCE AMENDED) A plasma display panel which display colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, wherein a chromaticity coordinate value during a white display is roughly constant regardless of a display load which depends on a luminance and/or a display area of a display image.

8. (AS ONCE AMENDED) A plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during

discharges, wherein a color temperature value during a white display is roughly constant regardless of a display load which depends on a luminance and/or a display area of a display image.

9. (AS ONCE AMENDED) A plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, wherein a deviation from a color temperature curve denoted by a black body radiation curve during a white display is roughly constant regardless of a display load which depends on a luminance and/or a display area of a display image.

10. (AS ONCE AMENDED) A plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, wherein a chromaticity coordinate value during a white display is within ±0.005uv of a deviation region from a color temperature curve denoted by a black body radiation curve regardless of a display load which depends on a luminance and/or a display area of a display image.

11. (ONCE AMENDED) A plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, comprising:

a detector to estimate a display load factor by detecting one of a power consumption of the plasma display panel and a drive frequency of sustain discharges of the plasma display panel; and

a drive unit, which receives an image signal of said different colors, driving the plasma display panel and changing [a] the drive frequency of sustain discharges according to [a] the estimated display load factor, and changing [to change] an [emission] intensity of the image signal of a [one or more of the plurality of fluorescent substances of] predetermined color[s,] so that a ratio of an emission intensity of each of the different colors during a white display is substantially equal regardless of the display load factor.

12. (AS UNAMENDED) The plasma display panel according to claim 11, wherein the display load factor changes.

13. (ONCE AMENDED) The plasma display panel according to claim 11, wherein when the display load factor increases from a first level to a second level, higher than the first level, by increasing a luminance and/or a display area of a display image, the drive unit decreases an [emission] intensity of the image signal of green light from a first intensity to a second intensity less than the first intensity or increases an [emission] intensity of the image signal of blue light from a third intensity to a fourth intensity greater than the third intensity.

14. (ONCE AMENDED) The plasma display panel according to claim 11, wherein when the display load factor decreases from a first level to a second level, lower than the first level, by decreasing a luminance and/or a display area of a display image, the drive unit increases an [emission] intensity of the image signal of green light from a first intensity to a second intensity greater than the first intensity or decreases an [emission] intensity of the image signal of blue light from a third intensity to a fourth intensity less than the third intensity.

15. (ONCE AMENDED) The plasma display panel according to claim 13, wherein said drive unit detects [a] the power consumption of the plasma display panel and adjusts the [emission] intensity of the image signal of the green light and/or the [emissions] intensity of the image signal of the blue light based on a relationship between display load factor changes and power consumption changes.

16. (ONCE AMENDED) The plasma display panel according to claim 14, wherein said drive unit detects [a] the power consumption of the plasma display panel and adjusts the [emission] intensity of the image signal of the green light and/or the [emissions] intensity of the image signal of the blue light based on a relationship between display load factor changes and power consumption changes.

17. (ONCE AMENDED) The plasma display panel according to claim 13, wherein said drive unit detects the drive frequency of the sustain discharges of the plasma display panel and adjusts the [emission] intensity of the image signal of the green light and/or the [emissions] intensity of the image signal of the blue light based on a relationship between display load factor changes and drive frequency changes.

18. (ONCE AMENDED) The plasma display panel according to claim 14, wherein said drive unit detects the drive frequency of the sustain discharges of the plasma display panel and adjusts the [emission] intensity of the image signal of the green light and/or the [emissions] intensity of the image signal of the blue light based on a relationship between display load factor changes and drive frequency changes.

19. (ONCE AMENDED) The plasma display panel according to claim 13, wherein said drive unit detects a luminance value and/or a display area value of each color to be supplied per predetermined unit time, and adjusts the [emission] intensity of the image signal of the green light or the [emission] intensity of the image signal of the blue light based on a relationship between changes of the display load factors and changes of an accumulated total of an luminance value and/or a display area value per predetermined unit time.

20. (ONCE AMENDED) The plasma display panel according to claim 14, wherein said drive unit detects a luminance value and/or a display area value of each color to be supplied per predetermined unit time, and adjusts the [emission] intensity of the image signal of the green light or the [emission] intensity of the image signal of the blue light based on a relationship between changes of the display load factor and changes of an accumulated total of an luminance value and/or a display area value per predetermined unit time.

21. (AS UNAMENDED) A plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, comprising:

a drive frequency detection unit to detect a drive frequency and adjust output values of a gamma table in a gamma conversion process according to the detected drive frequency so that a ratio of an emission intensity of each of the different colors during a white display is substantially equal regardless of the display load factor.

22 (ONCE AMENDED) A method of driving plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, comprising:

driving the plasma display panel according to an image signal while [by] changing a drive frequency of sustain discharges according to a change of a display load factor, and changing

[thereby to change] an [emission] intensity of the image signal [one or more of the plurality of fluorescent substances] of predetermined colors[,] so that a ratio of an emission intensity of each of the different colors during a white display is substantially equal regardless of the display load factor.

23. (AS UNAMENDED) A method of driving plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, comprising:

detecting a drive frequency; and

adjusting output values of a gamma table in a gamma conversion process according to the detected drive frequency so that a ratio of an emission intensity of each of the different colors during a white display is substantially equal regardless of the display load factor.

24. (ONCE AMENDED) A method of driving plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, comprising:

driving the plasma display panel according to an image signal while [by] decreasing a drive frequency of sustain discharges as a display load factor increases, and changing [thereby to change] an [emission] intensity of the image signal [a fluorescent substance] of a predetermined color, so that a ratio of [the] an emission intensity of said fluorescent substance of each color during a white display is roughly the same when said display load factor is low and high, depending on a change of the display load factor.

25. (ONCE AMENDED) A method of driving plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, comprising:

driving the plasma display panel according to an image signal while [by] decreasing a drive frequency of sustain discharges as a display load factor increases, wherein when the display load factor increases, an [emission] intensity of the image signal of green is decreased or an [emission] intensity of the image signal of blue is increased compared with a case when the display load factor is lower.

26. (ONCE AMENDED) A method of driving plasma display panel which displays colors by exciting a plurality of fluorescent substances of different colors using ultra-violet rays generated during discharges, comprising:

driving the plasma display panel according to an image signal while [by] decreasing a drive frequency of sustain discharges as a display load factor increases, wherein when the display load factor decreases, an [emission] intensity of the image signal of blue is decreased or an [emission] intensity of the image signal of green is increased compared with a case when the display load factor is higher.